

**WE CLAIM:**

1. An apparatus for assigning parameters to, configuring and starting up a control system and for creating a control program comprising a device for editing a control program, and device for compiling the control program, wherein the editing device is used to mark an area of the control program for debugging, and the compiling device is used to produce from the control program an intermediate code which contains debug instrumentation for the marked area of the control program.
2. The apparatus according to claim 1, wherein the intermediate code is microprocessor-independent.
3. The apparatus according to claim 1, further comprising a data storage device for association information for associating the marked area of the control program with an area of the intermediate code.
4. The apparatus according to claim 1, wherein the editing device comprises an order unit for dispatching an observation order for the marked area.
5. The apparatus according to claim 1, wherein the editing device further comprises a reception device for receiving observation information.
6. An apparatus for controlling the timing in a control system control program comprising a microprocessor for executing a compiled control program, a device for compiling a precompiled control program having debug instrumentation into an object code for the microprocessor.
7. The apparatus according to claim 6, further comprising an observation module using the debug instrumentation.

8. The apparatus according to claim 7, further comprising a data buffer for storing and providing observation information from the observation module.

9. The apparatus according to claim 7, further comprising device for receiving an execution order for the observation module.

10. A control system comprising an apparatus according to claim 1 and an apparatus according to claim 6, wherein the intermediate code corresponds to the precompiled control program.

11. A method for assigning parameters to, configuring and starting up a control system and for creating a control program comprising editing a control program, compiling the control program, marking an area of the control program for debugging during editing, and producing an intermediate code from the control program during compiling, said intermediate code containing debug instrumentation for the marked area of the control program.

12. The method according to claim 11, wherein the intermediate code is microprocessor-independent.

13. The method according to claim 11, wherein the marked area of the control program is associated with an area of the intermediate code.

14. The method according to claim 11, further comprising dispatching an observation order for observing the marked area during editing.

15. The method according to claim 14, wherein observation information is received during editing.

16. A method for controlling the timing in a control system on the basis of a control program comprising executing a compiled control program, by compilation of a precompiled control program having debug instrumentation into an object code for a microprocessor.

17. The method according to claim 16, further comprising setting up an observation module using the debug instrumentation.

18. The method according to claim 17, further comprising storing and providing information from the observation module in a data buffer device.

19. The method according to claim 17, further comprising receiving and carrying out an execution order for the observation module during execution of the control program.

20. A method for controlling a control system comprising the method according to claim 11 and the method according to claim 16, wherein the intermediate code corresponds to the precompiled control program.

21. An apparatus according to claim 1, wherein the control program is a cyclic control program.

22. An apparatus according to claim 6, wherein the compiled control program is a compiled cyclic control program.

23. A control system according to claim 10, wherein the control program is a cyclic control program.

24. A method according to claim 11, wherein the control program is a cyclic control program.

25. A method according to claim 16, wherein the compiled control program is a compiled cyclic control program.
26. A method according to claim 20, wherein the control program is a cyclic control program.